

REDESCRIPTION OF THE GARTER SNAKE  
*THAMNOPHIS EXSUL* ROSSMAN, 1969  
(SERPENTES: COLUBRIDAE)

Douglas A. Rossman, Ernest A. Liner, Carlos H. Treviño, and  
Alan H. Chaney

*Abstract.*—*Thamnophis exsul*, previously known only from the holotype from Coahuila, is redescribed on the basis of nine recently collected specimens from Nuevo León. An ontogenetic change in dorsal color pattern is apparent in the Nuevo León sample. Notes on the habitat and associated herpetofauna are also presented.

---

*Thamnophis exsul* was described by Rossman (1969) from a single specimen collected 17.7 km E, 5.6 km S San Antonio de las Alazanas, Coahuila, Mexico, by M. D. Sabath on 6 Jul 1961. Subsequent attempts to find additional specimens at or near the type locality by field crews from Louisiana State University and Texas A&M University, as well as by E. A. Liner, were unsuccessful. In the summer of 1979, Treviño sent Rossman two puzzling garter snakes (Universidad Autonoma de Nuevo León, UANL 2250-51) that had been collected in southern Nuevo León the previous fall and tentatively identified as *T. chrysocephalus*. Rossman soon concluded that, despite striking differences in color pattern from the holotype of *T. exsul* (Fig. 1), the Nuevo León snakes were more closely related to *exsul* than to any other known species of *Thamnophis*. Subsequent collecting in southern Nuevo León by E. A. Liner, A. H. Chaney, and the late R. M. Johnson has yielded seven additional specimens; these animals shed new light on the previously noted pattern differences, and it now seems almost certain that the Coahuila and Nuevo León snakes are conspecific. The purpose of this article is to redescribe what remains the rarest species of garter snake.

*Thamnophis exsul* Rossman, 1969  
Figs. 1-2

*Specimens examined.*—Coahuila: 17.7 km E, 5.6 km S San Antonio de las Alazanas (holotype, National Museum of Natural History, USNM 166423). Nuevo León: Zaragoza, Rancho La Encantada (UANL 2250-51); 19.6 km NE San Antonio de Peña Nevada (Ernest A. Liner, EAL 4820, 4837; Louisiana State University Museum of Zoology 43836); 17.9 km NE San Antonio de Peña Nevada (EAL 4971, 4 specimens).

*Definition.*—The smallest species of *Thamnophis* (maximum recorded snout-vent length = 360 mm), *T. exsul* is characterized by having: a maximum of 17 dorsal scale rows (in 90% of specimens), usually with no posterior reduction to 15 rows (80%); 7 supralabials on at least one side of the head (90%); 8 infralabials on at least one side (90%); 142-150 ventrals in ♀♀, 152-156 in ♂♂; 52-56 subcaudals in ♀♀, 63-65 in ♂♂; tail length 18.9-20.0% of total length in ♀♀, 21.8-22.2% in ♂♂; 19-21 maxillary teeth, the last 2 or 3 slightly enlarged; the dorsum almost uniformly putty brown with 3 indistinct light stripes, or having 3 or 4 alternating rows of spots or blotches with the light stripes partially or completely suppressed.

Table 1.—Selected head scale proportions in adult *Thamnophis exsul*. All ratios expressed as a percent.

Character	Sex	$\bar{x}$	Range	n
Internasal-rostral contact/nasal-rostral contact	♂♂	144.8	141.7–147.9	2
	♀♀	150.0	142.6–164.3	3
Prefrontal suture length/internasal suture length	♂♂	101.6	100.0–103.1	2
	♀♀	143.3	139.6–147.2	3
Muzzle width <sup>1</sup> /muzzle length <sup>2</sup>	♂♂	114.4	111.3–117.4	2
	♀♀	121.5	115.1–128.2	3
Muzzle length/frontal length	♂♂	73.9	72.3–75.4	2
	♀♀	65.0	60.2–70.2	3
Eye diameter/frontal length	♂♂	67.5	66.0–68.9	2
	♀♀	58.8	57.5–60.6	3
Frontal length/parietal length	♂♂	75.7	74.2–77.1	2
	♀♀	78.0	74.2–81.0	3
Frontal width/frontal length	♂♂	50.6	41.4–59.7	2
	♀♀	62.4	60.6–64.1	3
Frontal width posterior <sup>3</sup> /frontal width anterior	♂♂	97.5	91.1–103.8	2
	♀♀	88.0	85.0–92.2	3
Loreal length dorsal <sup>4</sup> /loreal length ventral	♂♂	63.0	60.6–65.4	2
	♀♀	60.9	58.8–62.2	3

<sup>1</sup> Combined width of internasals at posterolateral corners.

<sup>2</sup> Combined length of internasal and prefrontal medial sutures.

<sup>3</sup> Where parietals meet supraoculars and frontal.

<sup>4</sup> Measured to prefrontal-preocular junction.

*Description of holotype.*—See Rossman (1969).

*Variation.*—Dorsal scale rows are 17-15-17 (1 specimen), 17-17-15 (2), 17-17-17 (6), and 19-17-17 (1). Where posterior reduction occurs, it results from the loss of row four at about 60% of the distance from the first to the last ventral scute.

Ventrals average 145.0 (142–150) in 8 ♀♀, 154.0 (152–156) in 2 ♂♂; subcaudals 53.4 (52–56) in 7 ♀♀, 64.0 (63–65) in 2 ♂♂; tail as a % of total length 19.4 (18.9–20.0) in 7 ♀♀, 22.0 (21.8–22.2) in 2 ♂♂. Total supralabials on both sides number 12 (1 specimen), 14 (7), and 15 (2); total infralabials 16 (8), 17 (1), and 19 (1).

In the five snakes that lack a well-defined umbilical scar, head length as a percent of snout-vent length is 5.3 (237 mm SVL), 5.2 (274), 4.7 (330), 4.8 (347), and 4.6 (360), respectively. There appears to be some ontogenetic change in this character, the large specimens having a proportionately shorter

head. Head scale measurements were made on the preceding five snakes and a series of ratios generated (Table 1). Noticeable sexual dimorphism appears to be present in several characters (prefrontal suture length/internasal suture length, eye diameter/frontal length), but the sample size is so small that these distinctions may disappear when data from additional specimens become available.

In the Nuevo León sample, there appears to be a marked ontogenetic change in dorsal color pattern. The juveniles (Fig. 2, lower) are prominently spotted in three or four alternating rows, the former condition resulting from the fusion of spots in the upper two rows. The anteriormost 0–7 spots may be vertically enlarged to extend to, or fuse across, the vertebral scale row. The vertebral stripe is absent or faint and interrupted at intervals by the dorsal spotting. There is a prominent dark nuchal blotch that may or may not be very narrowly divided by the

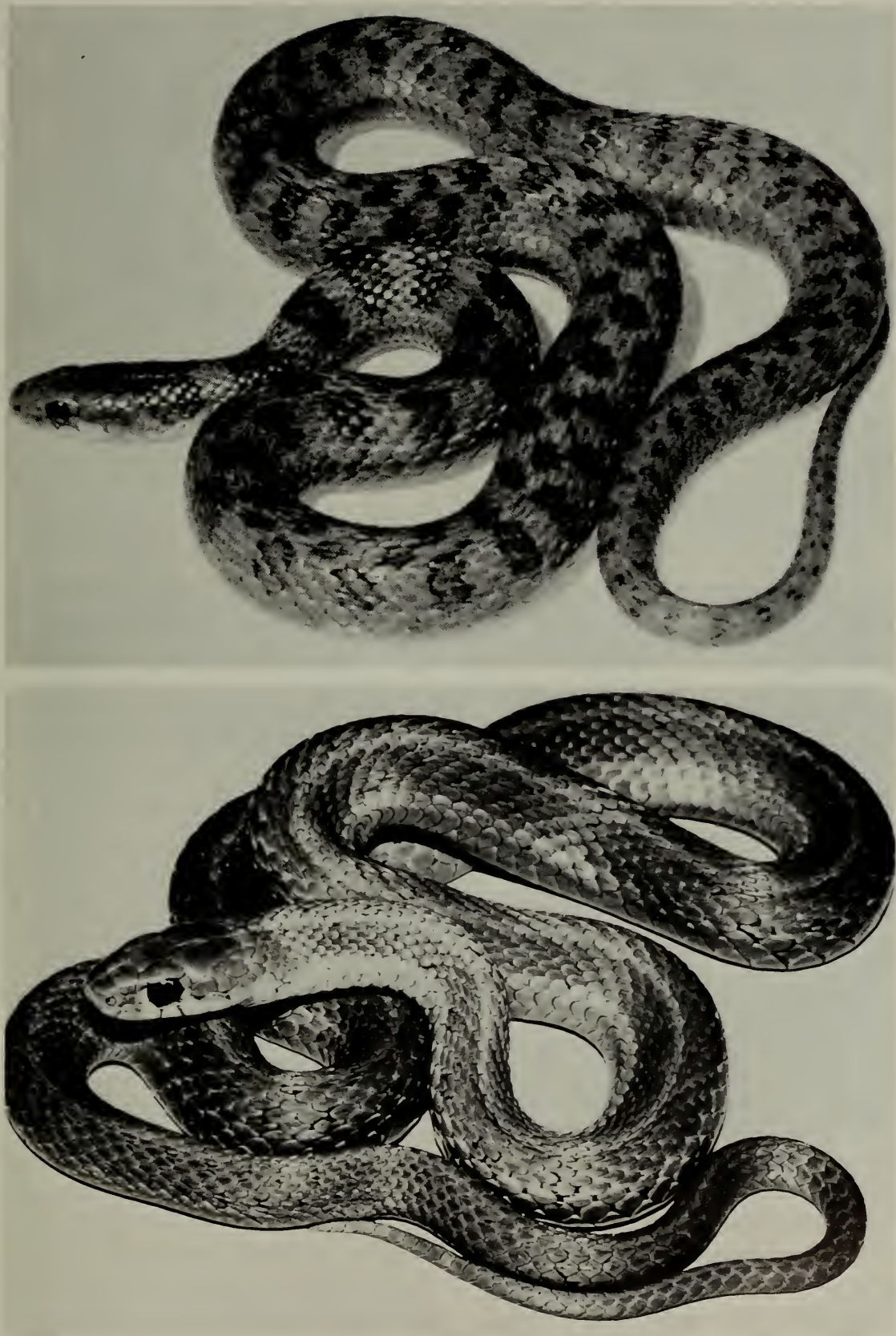


Fig. 1. Upper: Holotype of *Thamnophis exsul* from 17.7 km E, 5.6 km S San Antonio de las Alazanas, Coahuila, Mexico. Reprinted with permission from Rossman (1969). Lower: Adult *Thamnophis exsul* (EAL 4837) from 19.6 km NE San Antonio de Peña Nevada, Nuevo León, Mexico.

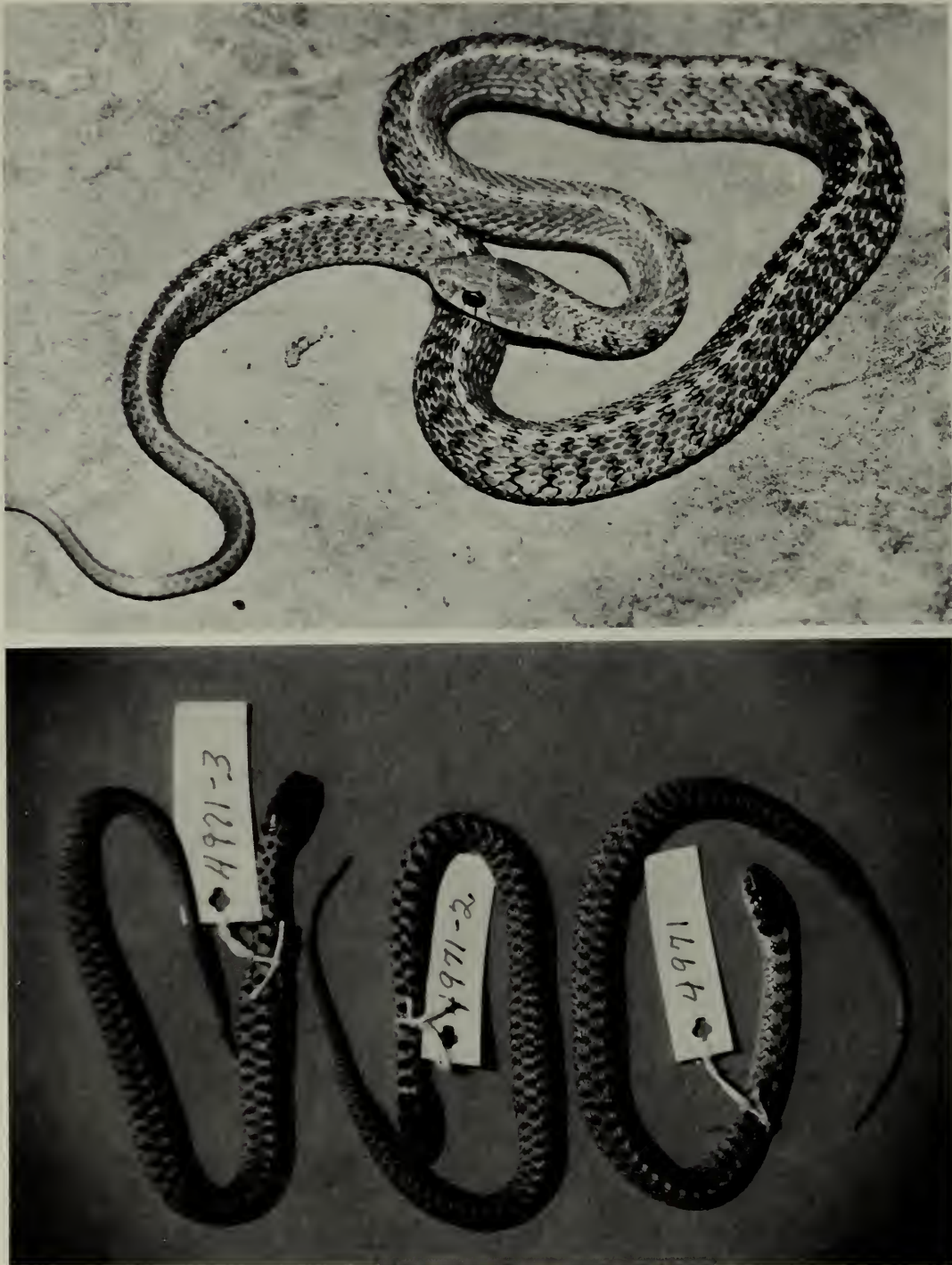


Fig. 2. Upper: Subadult *Thamnophis exsul* (LSUMZ 43836) from 19.6 km NE San Antonio de Peña Nevada, Nuevo León, Mexico. Lower: Three juvenile *Thamnophis exsul* (EAL 4971) from 17.9 km NE San Antonio de Peña Nevada, Nuevo León, Mexico.

vertebral stripe. The nuchal blotch is either continuous with the dark dorsal coloration of the head or narrowly separated from it by a lighter zone (less than one scale long) immediately posterior to the parietals. The spotted pattern of the subadult (Fig. 2, up-

per) is less distinct than that of the juveniles, and is barely, if at all, discernible in the larger adults (Fig. 1, lower).

The lone example from Coahuila, an adult, differs from the Nuevo León animals in retaining the juvenile pattern, in having

larger spots, and in having total suppression of the vertebral stripe (Fig. 1, upper).

The everted hemipenis (Fig. 3) of EAL 4837 is single with the distal half greatly expanded. The sulcus spermaticus is simple and terminates apically between raised lips. The apical surface of the expanded portion is nude. The remainder of the organ is spinose, the spines being very small on the expanded portion, but becoming larger proximally. One enlarged basal hook lies somewhat removed from the sulcus.

Teeth average 20.3 (19–21) on six maxillae, 12.0 (12) on two palatines, 22.0 (21–23) on two pterygoids, and 22.5 (22–23) on two dentaries.

*Relationships.*—None of the data provided by the new material contradicts Rossman's 1969 conclusion that *Thamnophis exsul* more nearly resembles *T. scalaris* than it does any other garter snake. A detailed comparison of the two species awaits completion of a variational study of the *T. scalaris* complex now in progress by Rossman. The lack of posterior dorsal scale row reduction in most (8 to 10) *T. exsul* is an unusual, but not unique, condition for a *Thamnophis*. Most of the *T. godmani* examined thus far from Oaxaca and Puebla have 17-17-17 rows, as do 20% of the *T. scalaris* from Veracruz.

*Ecological notes.*—Both the Coahuila and Nuevo León localities are situated in montane areas at elevations between 2650–2800 meters (Fig. 4). The adult specimens from Puerto de Peña Nevada were found in meadows with mixed oak, pine, madrone, and scrub brush, the meadows being used for grazing (Fig. 5, upper). The snakes were found in mid-morning after the cloud cover had lifted, but while the ground cover was still moist. When discovered in the open, the snakes crawled rapidly toward the scrub cover that was never far away. The young of the year were collected from a rotten log on an oak-madrone hillock with scattered logs, agave, and rocks (Fig. 5, lower). No

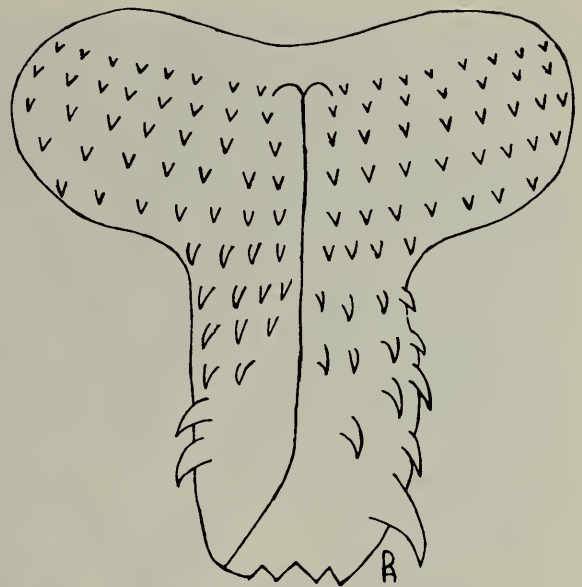


Fig. 3. Drawing of everted hemipenis of adult male *Thamnophis exsul* (EAL 4837). All spines save the larger ones are diagrammatically approximated.

standing water or streams were found in the area. The habitat at Rancho La Encantada was generally similar to that described for the Puerto de Peña Nevada area; but the holotype from Coahuila was found in a grassy "sump" above the head of a steep canyon (Rossman 1969).

During Liner's visits to the Puerto de Peña Nevada area, all in July, clouds would start to roll in around 1600 h; instead of the usual mist, a light drizzle (along with thunder and lightning) often would accompany the clouds and the temperature would then turn decidedly colder. In the morning, the sky would clear around 0900 h; during mid-day it was sunny and hot.

The associated herpetofauna in the Puerto de Peña Nevada area was: *Chiropterotriton priscus*, *Pseudoeurycea galeanae*, *Crotalus pricei*, *Storeria occipitomaculata*, *Thamnophis cyrtopsis*, *Barisia imbricata*, *Eumeces brevirostris*, *Sceloporus grammicus*, *S. scalaris*, *S. torquatus* (Liner, pers. obs.); at Rancho La Encantada, *Crotalus lepidus*, *Storeria occipitomaculata*, *Barisia* species, *Sceloporus grammicus*, and *S. torquatus* (Treviño, pers. obs.); and at the type

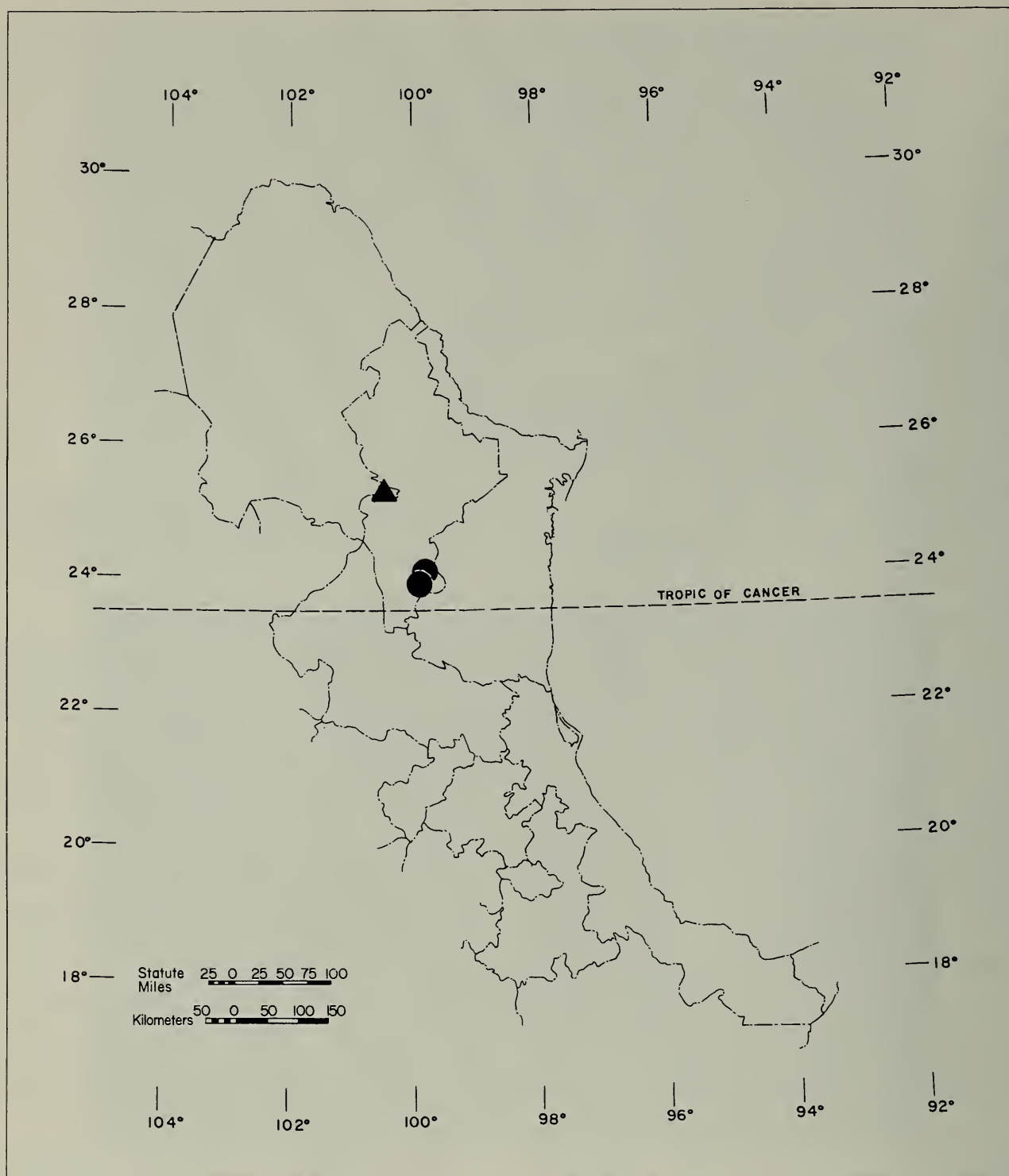


Fig. 4. Map of northwestern Mexico showing known localities for *Thamnophis exsul*. Triangle represents type locality in Coahuila; circles represent the Nuevo León localities.



Fig. 5. Upper: Habitat 19.6 km NE San Antonio de Peña Nevada, Nuevo León, Mexico, where adult specimens of *Thamnophis exsul* were collected. Lower: Habitat 17.9 km NE San Antonio de Peña Nevada, Nuevo León, Mexico, where juvenile specimens of *Thamnophis exsul* were collected.

locality in Coahuila, *Crotalus pricei*, *Barisia imbricata*, *Eumeces dicei* (= *brevirostris*), *Sceloporus grammicus*, and *S. jarrovi* (Axtell and Sabath, 1963; Liner, Rossman, and Johnson, 1974).

#### Acknowledgments

We wish to express our gratitude to the late Richard M. Johnson, who helped to collect some of the Nuevo León specimens; to Richard M. Blaney for serving as a courier to bring the UANL specimens to Rossman; and to the officials of the Dirección General de la Fauna Silvestre in Mexico City for issuing the necessary scientific collecting permits to Liner over the years.

#### Literature Cited

- Axtell, R. W., & M. D. Sabath. 1963. *Crotalus pricei miquihuanus* from the Sierra Madre of Coahuila, Mexico.—*Copeia* 1963(1):161–164.
- Liner, E. A., D. A. Rossman, & R. M. Johnson. 1973[1974]. Life history: *Gerrhonotus (Barisia) imbricatus ciliaris*.—*HISS News-Journal* 1(6):185.
- Rossman, D. A. 1969. A new natricine snake of the genus *Thamnophis* from northern Mexico.—*Occasional Papers of the Museum of Zoology, Louisiana State University* (39):1–4.
- (DAR) Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana 70803; (EAL) 310 Malibou Boulevard, Houma, Louisiana 70364; (CHT) Facultad de Ciencias Biologicas, Universidad Autonoma de Nuevo León, San Nicolas de los Garza, Nuevo León, Mexico; (AHC) Department of Biology, Texas A&I University, Kingsville, Texas 78363.